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10/733,862	12/10/2003	Torsten Berger	SNS-013	8061

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EXAMINER	
CASCHERA, ANTONIO A	

ART UNIT	PAPER NUMBER
2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/733,862	BERGER ET AL.	
	Examiner	Art Unit	
	Antonio A. Caschera	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. Receipt is acknowledged of a request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission, filed on 10/31/07.

Claim Objections

2. Claims 68 and 76 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In reference to claims 68 and 76, these claims comprise the limitation of the user-defined region being arbitrarily-shaped however such a limitation is already present in claims 56 and 70 from which claims 68 and 76 depend upon respectively. In particular, claims 56 and 70 explicitly recite, "A method for wrapping texture...in an arbitrarily-shaped user-defined region of the surface...(i) mapping the location in the arbitrarily-shaped, user-defined region...(ii) assigning to the location in the arbitrarily-shaped, user-defined region..." (see lines 1-4 and 9 of claim 56) and "An apparatus for wrapping a texture...for each of a plurality of locations in an arbitrarily-shaped, user-defined region..." (see lines 1 and 5 of claim 70).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 56, 57 and 65-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dumesny et al. (U.S. Pub 2002/0154132 A1) in view of Piponi et al. ("Seamless texture mapping of subdivision surfaces by model pelting and texture blending," SIGGRAPH 2000. ACM Press/Addison-Wesley Publishing Co. New York, NY. pgs. 471-478. ISBN:1-58113-208-5).

In reference to claims 56 and 70, Dumesny et al. discloses a user interface, method and computer system operating a user interface, for applying a texture to a 3D graphic object and modifying the texture using several techniques (see paragraph 9, lines 1-5, paragraph 13, lines 1-7 and paragraph 76, lines 7-11). Dumesny et al. discloses allowing the user to select a defined region of a 3D graphic object and map the selected regions or polygons to a texture map (see paragraphs 13, 44, 47 and 48). Dumesny et al. discloses that after the user has selected the defined region in object space, an associated square region is defined and displayed in texture space (see paragraph 38, lines 5-9 and #110, 111 of Figure 11A). Note, the Office interprets such texture space square region functionally equivalent to Applicant's "planar mesh" limitation. Dumesny et al. further discloses allowing the user to adjust the square region size and shape, in texture space, which inherently alters the mapping of the texture to the object space defined region (see paragraph 48, last 3 lines and paragraph 49). Further note, since the user defined

region of the object is only part of the object and the alteration of the texture square region modifies the mapping onto such a user defined region, the Office interprets such a user defined region functionally equivalent to the "patch" of Applicant's claims. Dumesny et al. also discloses assigning texture map coordinate values to the corresponding polygons since when Dumesny et al. performs texture mapping, coordinates of object space and texture map space are associated and texture values are therefore also inherently associated (see paragraphs 4 and 5). Note, the Office interprets the "graphical value" of Applicant's claim functionally equivalent to the texture value comprised within a texture map as seen in Figure 4 of Dumesny et al.. Further in reference to claim 70, Dumesny et al. discloses a storage medium or device, such as a CD-Rom, hard disk or magnetic disk for storing computer programs which, when executed, perform the above disclosed methods (see paragraphs 75-76). Also, Dumesny et al. discloses a processor for executing the above computer programs (see paragraph 75). Dumesny et al. discloses that after the user has selected the defined region in object space, an associated square region is defined and displayed in texture space (see paragraph 38, lines 5-9 and #110, 111 of Figure 11A). Dumesny et al. further discloses allowing the user to adjust the square region size and shape, in texture space, which inherently alters the mapping of the texture to the object space defined region (see paragraph 48, last 3 lines and paragraph 49). Dumesny et al. explicitly discloses, in the example of paragraph 49, that as the user transforms the square region, making it smaller in size, the object space user defined region is updated in real time so that the texture map is now stretched over the user defined region (see last 8 lines of paragraph 49). The Office interprets that if reducing the size of the texture space square region results in a loss of quality, because of stretching the texture map over the object, increasing the size of the texture space

would conversely provide the effect of gaining quality since a smaller area of the object region would be covered by the texture. Dumesny et al. explicitly discloses allowing a user to select the region via one or more of particular polygons of a 3D graphic object to texture map data thereto (see paragraphs 44 and 47 and Figure 9B #94, 96 and 97). Dumesny et al. explicitly discloses that only if no polygons are selected by a user that all polygons forming the 3D object are subsequently textured (see last 3 lines of paragraph 44). Also, Dumesny et al. explicitly describes the 3D graphic object of which the user is capable of texture mapping, via the selection of a region of the graphic object, as having, "...arbitrarily complex surfaces," (see paragraph 14 more specifically lines 1-6, right column, page 2 and paragraph 67, lines 1-5). Dumesny et al. does not explicitly disclose the mapping models based on a plurality of points of the mesh connected by mechanical modeling elements. Piponi et al. discloses a method for finding both optimal and intuitive texture mapping over almost all of an entire subdivision surface and combining the mappings together to produce a seamless result (see last 4 lines of the abstract, pg. 471). Piponi et al. discloses the method to, for example, involve adding springs to the boundary of a disk with opposing ends of the springs attached to a surrounding fixed frame (see pg. 473, left column last paragraph "There are a number..." and Figure 2.). Piponi et al. also explicitly discloses minimizing the energy of the collection of springs using further derived equations of motion, adding damping terms and running a dynamics solver until a steady state is achieved (see pg. 473, left column, last paragraph, lines 1-10 and Figure 2). Note, the Office interprets such "springs" of Piponi et al. functionally equivalent to Applicant's "mechanical modeling elements" since further claims 65 and 73 define the "mechanical modeling elements" as such. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

implement the texture mapping techniques of subdivision surfaces of Piponi et al. with the graphical object texturing techniques of Dumesny et al. in order to create a seamless texture mapping of polygonal models and subdivision surfaces while still creating a system that is efficient in its processing and intuitive for users to operate (see pg. 471, right column, "Introduction" lines 6-8 of Piponi et al. & see pg. 472, left column, lines 23-40, "Using a solid..." of Piponi et al.). (see *Response to Arguments* below).

In reference to claims 57 and 71, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively above in addition, Dumesny et al. discloses graphically rendering the object in real-time as the user modifies texture values (see paragraph 49).

In reference to claims 65, 66, 73 and 74, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively above. Piponi et al. discloses the method to, for example, involve adding springs to the boundary of a disk with opposing ends of the springs attached to a surrounding fixed frame (see pg. 473, left column last paragraph "There are a number..." and Figure 2.).

In reference to claims 67 and 75, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively above. Piponi et al. also explicitly discloses minimizing the energy of the collection of springs using further derived equations of motion, adding damping terms and running a dynamics solver until a steady state is achieved (see pg. 473, left column, last paragraph, lines 1-10 and Figure 2).

In reference to claims 68 and 76, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively above. Dumesny et al. discloses allowing the user to select a defined region of a 3D graphic object and map the selected regions or polygons to a texture map (see paragraphs 13, 44, 47 and 48).

In reference to claim 69, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Dumesny et al. discloses allowing the user to select a defined region of a 3D graphic object and map the selected regions or polygons to a texture map (see paragraphs 13, 44, 47 and 48). Note, the Office sees no indication in Dumesny et al. of performing geometric projection when mapping the texture onto the 3D object in Dumesny et al.

In reference to claim 72, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 71 above in addition, Dumesny et al. explicitly discloses utilizing a CRT as the display device (see paragraph 2).

4. Claims 58-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dumesny et al. (U.S. Pub 2002/0154132 A1), Piponi et al. ("Seamless texture mapping of subdivision surfaces by model pelting and texture blending," SIGGRAPH 2000. ACM Press/Addison-Wesley Publishing Co. New York, NY. pgs. 471-478. ISBN:1-58113-208-5) and further in view of Leather et al. (U.S. Patent 6,707,458 B1).

In reference to claim 58, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 57 above however, neither Dumesny et al. nor Piponi et al. explicitly disclose modifying a voxel representation of the object according to the texture values. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9

and Figure 20A). Leather et al. further discloses performing embossing type bump mapping effects on incoming processed texture coordinates (see columns 9-10, lines 56-3), the bump mapping further comprising a bump mapping displacement associated with each texture coordinate (see column 10, lines 8-20). Note, the Office interprets the depth/height of the object being altered using the texture bump mapping displacement values of Leather et al., equivalent to the modifying of a voxel representation of the object using the "graphical values" of Applicant's claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture tiling techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 59, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above however, neither Dumesny et al. nor Piponi et al. explicitly disclose the texture being of a tiled type. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture tiling techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 60, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 59 above. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). Leather et al. also explicitly discloses improving on the past technique of texture tiling, which used to draw a polygon for each desired tile meaning each tile was constrained to align with a polygon (see column 4, lines 17-20).

In reference to claim 61, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 59 above. Dumesny et al. discloses graphically rendering the object in real-time as the user modifies texture values (see paragraph 49). Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A).

In reference to claim 62, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Dumesny et al. discloses assigning texture map coordinate values to the corresponding polygons since when Dumesny et al. performs texture mapping, coordinates of object space and texture map space are associated and texture values are therefore also inherently associated (see paragraphs 4 and 5). Note, the Office interprets the "graphical value" of Applicant's claim functionally equivalent to the texture value comprised within a texture map as seen in Figure 4 of Dumesny et al.. Further, the texture value output from a texture map is well known in the art to be a color value as explicitly shown in Leather et al. (see Figures 7A and 7B). It would have been obvious to one of ordinary skill in the art at the time the invention was made to interpret the texture value, associated with the selected texture

coordinate of a texture map, of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. with a color value since it is well known in the art that a texture map may hold color values, as shown in Leather et al. (see column 10, lines 31-36 of Leather et al.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texturing techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 63, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Although Dumesny et al. discloses assigning texture map coordinate values to corresponding polygons (see paragraphs 4 and 5), neither Dumesny et al. nor Piponi et al. explicitly disclose the texture map comprising an embossing pattern. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). Leather et al. further discloses performing embossing type bump mapping effects on incoming processed texture coordinates (see columns 9-10, lines 56-3), the bump mapping further comprising a bump mapping displacement associated with each texture coordinate (see column 10, lines 8-20 and Figures 7A, 7B). Further note, the Office interprets the displacement value of Leather et al. to inherently define an adjustment along a normal to the surface of a virtual object of Applicant's claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texturing techniques of Leather et al. with

the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 64, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 63 above. Dumesny et al. discloses graphically rendering the object in real-time as the user modifies texture values (see paragraph 49). Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A).

Response to Arguments

5. Applicant's arguments filed 10/31/07 have been fully considered but they are not persuasive.

In reference to claims 56-76, Applicant argues that none of the cited prior art of record explicitly disclose the limitation of the user-defined region being of arbitrary shape (see pages 8-11 of Applicant's Remarks).

In response, to the above argument as per claim 56 (and all dependent upon claim 56 claims) along with claim 70 (and all dependent upon claim 70 claims), Dumesny et al. explicitly discloses allowing a user to select a region via one or more of particular polygons of a 3D graphic object to texture map data thereto (see paragraphs 44 and 47). Further, Dumesny et al. explicitly discloses that only if no polygons are selected by a user that all polygons forming the 3D object are subsequently textured (see last 3 lines of paragraph 44). Even further however,

Dumesny et al. explicitly describes the 3D graphical object of which the user is capable of texture mapping, via a selection of a region of the graphic object, as having, "...arbitrarily complex surfaces," (see paragraph 14 more specifically lines 1-6, right column, page 2 and paragraph 67, lines 1-5). Therefore, the Office interprets at least Dumesny et al. of the combination of Dumesny et al. and Piponi et al. to disclose the argued feature as seen above.

Also, Applicant shows an example of the arbitrary shape drawn by a user onto a surface and states that such an object does not cover an entire face of the object and is not limited to sharp-edge polyhedra but can have soft edges (see bottom of page 8 of Applicant's Remarks). The Applicant seems to imply that these showings are brought out by the current claim language of "arbitrarily-shaped user-defined region." The Office disagrees and points to how the "user-defined" region is described in the specification. In particular, the specification utilizes the open-ended terms, "may" or "such as" to describe certain possibilities or examples of arbitrarily-shaped user-defined regions but doesn't make an exact equivalency to the term (see paragraphs 22 and 102). Therefore, the Office believes its interpretation of Dumesny et al. to be just especially when taking the term in its broadest sense in view of the specification.

Lastly, Applicant states it would not be obvious to combine the cited Dumesny et al. and Piponi et al. references and modify the combined teachings to allow for wrapping texture within an arbitrarily-shaped user-defined region (see top of page 9 of Applicant's Remarks). The Office disagrees and states in response to Applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the

knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Dumesny et al. discloses a user interface, method and computer system operating a user interface, for applying a texture to a 3D graphic object and modifying the texture using several techniques (see paragraph 9, lines 1-5, paragraph 13, lines 1-7 and paragraph 76, lines 7-11) and Piponi et al. discloses combining multiple texture mappings to create a seamless mapping over an entire surface of an object (see pg. 471, "Abstract" last 3 lines). Both references deal with performing texture mapping and texture mapping refinement upon irregular object surfaces and therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture mapping techniques of subdivision surfaces of Piponi et al. with the graphical object texturing techniques of Dumesny et al. in order to create a seamless texture mapping of polygonal models and subdivision surfaces while still creating a system that is efficient in its processing and intuitive for users to operate (see pg. 471, right column, "Introduction" lines 6-8 of Piponi et al. & see pg. 472, left column, lines 23-40, "Using a solid..." of Piponi et al.) thereby yielding a more visually satisfying output in a computer rendered environment. Therefore, the Office believes the rejection based upon Dumesny et al. and Piponi et al. to be valid.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781.

The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung, can be reached at (571) 272-7794.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (571) 272-2600.

aac

1/8/08

Antonio Caschera
Patent Examiner